valley, running north-west, and is rarely visited by thunderstorms, which pass nearly always to the right or left.

SOME researches on the magnetic properties of nickel were recently made by the well-known physicist M. H. Wild, and are now published in the *Bulletin* of the Imperial Academy of Sciences of St. Petersburg. M. Wild arrives at the following conclusions: (1) Pure nickel can become permanently magnetic to a considerable degree, thus differing materially from pure (soft) iron. The maximum qnantity of permanent magnetism which pure nickel can retain is, however, only between one half and one-third of that quantity which hard steel can permanently retain. (2) Magnetism is less permaaent in nickel than in well-hardened steel, after the magnetising force has ceased to act; the slow loss of magnetism in course of time, as well as by heating and cooling, is comparatively greater in nickel than in steel; and this is the case even if the nickel has, like hard steel, by repeated heating and cooling, been brought to a certain state of permanent capacity. (3) The temperature coefficient of nickel magnets in the latter state is a little larger than that of properly hardened steel. (4) The temperary magnetism which pure nickel can retain is about double its permanent quantity, or about one half of the temporary magnetism which hard steel, and about one quarter of that which soft iron can retain. In its magnetic properties nickel is, therefore, thoroughly inferior to iron and steel.

THE question with regard to the existence of microscopic organisms in media containing no oxygen has been a fruitful subject of discussion for biologists of late, and some doubts have been thrown on the entire absence of this gas in the experiments cited by Pasteur and others. Prof. von Nägeli, in his work on "Die niederen Pilze," which has just appeared in Munich, presents some interesting figures in this connection. According to his calculations the larger bacteria weigh $\frac{1}{2000000000}$ milligramme. If we assume that they consume the same amount proportionally of oxygen daily as a man, viz., 1 per cent. of his weight, then a million bacteria would require in twenty-four hours $\frac{1}{20000}$ milligramme, or nearly $\frac{1}{30000}$ cubic centimetre of oxygen. These calculations, taken in connection with the well-known difficulties of entirely eliminating gases, will probably render a repetition of the best experiments necessary.

FROM recent experiments on the spread of gases through bodies, Dr. Wroblewsky (*Pogg. Ann.*) arrives at the following conclusion:—When a gas is absorbed it spreads in the absorbent body according to the same laws as those ruling the propagation of heat in a solid bar; and that whether the absorbent body be liquid or solid, or in a transition state between these two extremes." The only exceptions to this law are attributable to the action of gravity. It is known that the excretion of carbonic acid by an animal is increased by a violent muscular action, but it has been uncertain whether the CO_2 is a direct product of muscular action, *i.e.*, belongs to the substances which, through decomposition processes, are formed in greater measure during contraction of the muscles. To clear up this point, M. Sedgwick-Minot recently forced through the vascular system of detached muscles of dogs (the blood having been removed) a quantity of blood-serum saturated with oxygen, and determined the proportion of CO_2 in the serum in a series of cases in which the muscles were at rest, and in another series in which they were repeatedly stimulated to contraction. If the contraction of the muscle caused a greater formation of CO_2, the serum, after passage, must contain more CO_2 than if the muscle remained at rest. The experiments, however, gave equal quantities of CO_2 in the two cases, and the reason of the fact referred to at the outset is not determined.

THE additions to the Zoological Society's Gardens during the past week include two Macaque Monkeys (*Macacus cynomolgus*) from India, presented respectively by Capt. Pole Carew, and Mr. Henry Wright; a Green Monkey (*Cercopithecus callitrichus*), two Common Chameleons (*Chamæleon vulgaris*) from West Africa, presented by Mr. G. H. Garrett; a Herring Gull (*Larus argentatus*), European, presented by Mr. Capstick; two Undulated Grass Parrakeets (*Melopsittacus undulatus*) from Australia, presented by Mr. Hylton Jolliffe; an American Darter (*Plotus anhinga*) from South America, purchased; two Sambur Deer (*Cervus aristotelis*), an Isabelline Bear (*Ursus isabellinus*) from India, a Javan Adjutant (*Leptoptilus javanicus*) from Java, received in exchange.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE

OXFORD.—Mr. J. R. Terry, M.A., Fellow of Magdalen College, who was Fifth Wrangler at Cambridge in 1873, has accepted the senior mathematical mastership in Magdalen College School; and Mr. D. C. Robb, B.A., scholar of Worcester College, has been appointed to a science mastership (in physics) at the same time.

CAMBRIDGE.—The report of the Council of the Senate recommending the appointment of an assistant to Prof. Hughes has been confirmed upon the understanding that the person to be appointed be not permitted to take private pupils.

EDINBURGH.—A movement has originated in the University of Edinburgh to procure a portrait of Prof. Balfour, in recognition of his services to the University in having for thirty years acted as Dean of the Medical Faculty. This movement has been joined in by the Fellows of the Royal Society of Edinburgh, in recognition on their part of the services he has for many years rendered to the Society in the character of Secretary.

BIRKBECK INSTITUTION.—A course of six lectures on Electric Telephony will be delivered by Mr. W. J. Wilson, F.C.S., on Saturday evenings, at eight o'clock, commencing March 23. The entire proceeds will be given to the fund now being raised for the erection of a new building for the institution. The lectures will be very fully illustrated by experiments, diagrams, &c., and will form a complete exposition of the subject.

PARIS.—M. Pierre Picard is proposed as a successor to the late Claude Bernard in the chair of physiology at the Collége de France. He was for a long time assistant to the famous physiologist, and is himself the author of valuable researches on the constitution of the blood corpuscles. At present he is a professor in the Faculty of Medicine at Lyons.

ALGERIA.—M. Bardoux proposes to establish in Algeria three preparatory schools for medical and law students, one in each of the three provinces. At present Algiers alone is provided with a preparatory school of medicine. The means for obtaining superior instruction, which have been very limited up to the present in the colony, will be greatly enlarged.

BERLIN.—On the night of the 8th instant the professors and students of the Berlin University, assisted by civil and military dignitaries, held a grand "Commers," or beer-drinking revelry, in the time-honoured style of German academical life, in honour of the sixtieth anniversary of the birthday of Prof. A. Hofmann, the celebrated chemist. The proceedings began by the secretary of the committee reading a letter from the Chamberlain of the Crown Prince expressing the regret of his Imperial Highness at being prevented from attending the festivity. After this Prof. Helmholtz, the Rector of the Berlin University, formally congratulated Dr. Hofmann, who replied in a speech to the felicitations addressed to him by his Berlin colleagues and friends. Numerous other speakers, among them Privy-Councillor Jacob, Chief of the Patent Office, and Prof. Reuleaux, Rector of the Berlin Polytechnic Academy, then addressed the hero of the day. The official part of the festivity closed at 2 o'clock, after which came the singing of all the obligatory songs and the delivery of student speeches. Not a few congratulatory letters and telegrams reached Prof. Hofmann on the auspicious day from England, America, and France.

PRUSSIA.—The three agricultural institutes of Prussia are attended at present by 270 students, of whom 215 are from Prussia, 20 from other parts of Germany, and 35 from foreign countries.

GERMAN POLYTECHNIC CONGRESS.—At the recent inauguration of the new Polytechnic Institution of Brunswick, the assembled men of science considered the question of a general congress of lecturers at the German polytechnic schools. It is intended to hold the congress at Dresden, and a preliminary meeting of delegates will take place in the beginning of April, in order to fix the programme for the congress. Dresden has also been selected as the meeting-place for a congress of German engineers and architects, and it is supposed that the two meetings will be held simultaneously.

SAXONY.—An interesting example of the comparative sums devoted in Germany to various educational purposes is to be seen in the recently-issued Report of the Minister of Public Instruction for Saxony, a kingdom with 2,550,000 inhabitants. The whole number of educational establishments is 3,900, of scholars and students, 523,000, of instructors, 6,400. The salaries amount to 12,300,000 marks, and the total educational expenses are 18,000,000, of which 5,000,000 are contributed by the Government. The State devotes 766,000 marks to its 76 gymnasia and *Realschulen*, 1,354,000 to the general school system, and nearly as much, viz., 1,048,000 marks to the University of Leipzig with its 161 professors and 3,100 students, besides 893,000 marks for pensions. The total annual cost of the Leipzig University is 1,402,000 marks, or 70,100*l*.

SCIENTIFIC SERIALS

Annalen der Physik und Chemie, No. 1, 1878.—The universal compensator, by M. Beetz.—On the electromotive force and the internal resistance of some thermopiles, by M. Beetz.—The theory of stationary currents regarded from a quite general standpoint, by M. v. Bezold.—On a tangent multiplier and the electromotive force of the Grove element, by M. Riecke.—On the influence of density of a body on the amount of light absorbed by it, by M. Glan.—On the theory of the longitudinal-elliptical vibrations in the incompressible ether, by M. Ketteler.—On fluorescence, by M. Lommel.—On metallic reflection, by M. Wernicke.—On the volume-increase of liquids through absorption of gases, by Messrs. MacKenzie and Nichols.—Some observations on Crookes's radiometer, by M. Riecke.—Determination of the resonance-tones of the mouth-cavity by percussion, by M. Auerbach.—On the pitch of a tuning-fork in an incompressible liquid, by M. Auerbach.

Zeitschrift für wissenschaftliche Zoologie, vol. xxx., part 1.—Rhizopod studies, by Emil Buck, 49 pp. 2 plates; dealing with the development of arcella, and a new genus parasitic on rotifers.—Revision of the genus analges (avian parasite), by G. Haller.—Contribution to the anatomy of asteridæ, by Hubert Ludwig, 4 plates, 63 pp., describing the water-vascular system, the blood system, the nervous and the generative apparatus, the body cavity.—Contribution to the natural history of the cestodes, by H. A. Pagenstecher, dealing with *Tænia crilica* and *Cœnurus serialis*.

SOCIETIES AND ACADEMIES

LONDON

Linnean Society, February 21.—W. Carruthers, F.R.S., vice-president, in the chair.—Mr. Thos. Christy illustrated by diagram and made remarks on M. Ossenkep's new system of plant-propagation; and he also showed the recently imported fresh berries of the Liberian coffee of this year's crop.—Mr. Holmes exhibited a remarkable oak gall of *Aphilothrix sieboldii*, Hart., obtained at Willesboro, Leas, Ashford.—Mr. Thiselton Dyer likewise exhibited and made a few observations on the inflorescence and a drawing of the palm *Ptychosperma rupicola*, Thw., which had flowered for the first time in Europe at Kew.—A paper, notes on the Mahwa tree (*Bassia latifolia*), was read by Mr. E. Lockwood. This tree grows in abundance in India; a hundred thousand may be seen in the plains around Monghyr. Wild animals of all kinds greedily devour the flowers, of which one tree will yield several hundredweights. Besides being highly nutritious to man, it is an excellent fattening agent for cattle, &c. A strong-smelling spirit is obtained by distillation of the corolla, an essential oil from the fruit, and as an agent in soap-making the tree is invaluable. Thus, certain yield, unlimited supply, nourishing and chemical qualities, easy preservation, and its cheapness, all combine to render it a commercial product of no mean importance to our Indian empire.—The gist of a "Synopsis of the Hypoxidaceæ," by Mr. J. G. Baker, was given. This group differs in some respects from the Amaryllidaceæ, and offers a close alliance with the Bellosiceæ. Four genera, and between sixty and seventy species are known. The Cape is their head-quarters, but some are found in Tropical Africa and Angola, a very few in Abyssinia and the Mascarenes. None are found in Europe, Polynesia, North and Central Asia, nor Extra Tropical South America.—The Secretary read an abstract of a technical paper on the Schoepfieæ and Cervantesiæ, distinct tribes of the Styraceæ, by John Miers, F.R.S.—Then followed a communication by Mr. Arthur G. Butler, on the butterflies in the collection of the British Museum, hitherto referred to the genus Euploea of Fabricius.—Dr. Hance, of China, Mr. E. Milner, Dr. Geo. Shearer, and the Rev. R. Boog Watson were elected Fellows of the Society.

Chemical Society, February 21.—Dr. Gladstone, president, in the chair.—A lecture entitled "Laboratory Experiences on board the *Challenger*" was delivered by Mr. J. Y. Buchanan. After describing his laboratory, which measured 10 feet by 5 feet 8 inches and 6 feet high, and its fittings, the lecturer gave a detailed account of the means by which, after estimating the compressibilities of water and mercury, he was enabled to determine the depths and temperatures attained by the sounding line. The compressibility of distilled water was found to be 0·000049 per atmosphere, or 0·0009 per 100 fathoms; of sea-water, 0·00077 per 100 fathoms; and of mercury, 0·0000271 per 100 fathoms, or 0·0000015 per atmosphere. He then described the apparatus and methods by means of which the amounts of oxygen, nitrogen, and carbonic acid were determined. The most interesting results obtained were the following:—From the surface down to 300 fathoms the amount of oxygen continuously decreases; from 300 fathoms downwards, whatever be the depth, the amount increases. This anomalous result the lecturer stated to be due to the great abundance of animal life at the depth of 300 fathoms, the increase in the quantity of oxygen at greater depths being caused by its non-consumption, owing to the scarcity of life. The next part of the lecture dealt with the distribution of the sea-water as regards density, in depth and superficially. Two regions of maximum density exist north and south of the equator, corresponding to the tracts frequented by the trade winds. At 350 fathoms deep a great zone of water of low density is found. The densest water is found in the Atlantic. Light water is found in the neighbourhood of ice and in certain regions immediately after the cessation of the monsoons. The maxima of density lie in the north hemisphere to the south-west, in the south to the north-west of the maxima of barometric pressure. A hearty and unanimous vote of thanks was given to Mr. Buchanan for his interesting lecture, which was illustrated by many tables and diagrams.

Physical Society, February 16.—Prof. W. G. Adams, president, in the chair.—The following candidate was elected a Member of the Society: Mr. G. H. West, M.A.—Dr. Lodge read, for Mr. H. F. Morley, M.A., a paper on Grove's gas battery. After referring to the views of M. Gaugain and Mr. Grove himself with regard to the cause of the action of this apparatus, the author proceeded to describe an elaborate series of experiments he has recently made in order to ascertain the circumstances by which it is regulated. It would be impossible to give a clear account of them in a short space, but some of his conclusions are as follows:—The whole of the current is due to dissolved gas, and if n be the distance of the level of the liquid from the top of the plate in the H tube, and $E = \frac{C\,R}{1{,}000}$, C being given in galvanometric readings and R in ohms, he finds that, approximately, $(1 + n\,a)\,C = b + n\,e - (c + n\,d)\,E$, where a, b, c, d, and e are constants. The electromotive force is not constant, but rises with the resistance. The current is greater in proportion as the gas present in the elements is less; and, finally, the current appears to vary directly with the pressure.—Mr. S. C. Tisley then described the harmonograph, specially referring to its use for drawing pairs of curves for the stereoscope. This, the latest forms of his pendulum apparatus, is capable of giving a very great variety of curves, for, in addition to rectangular vibrations, parallel and elliptic motions can be combined by its means. In the older form of apparatus each pendulum moves on the other as a centre, whereas in the instrument described they are independent. One pendulum carries at its upper end a table which can be caused to rotate by clockwork if required. The whole is supported on a kind of gimbal joint formed of two pairs of knife edges at right angles, so arranged that vibration